Promising new treatment to help people with spine injuries walk better

A study conducted at Emory's Center for Rehabilitation Medicine shows short periods of breathing low oxygen levels can help some patients with spinal cord injuries walk better.

The research was published in the Nov. 27, 2013 online issue of *Neurology*, the medical journal of the American Academy of Neurology.

"About 59 percent of all spinal injuries are incomplete, which means the injury leaves pathways that could enable the spinal cord to change in a way that allows people to walk again," says study author Randy D. Trumbower, PT, PhD, assistant professor of rehabilitation medicine, Emory University School of Medicine. "Unfortunately, a person affected by this type of spinal injury seldom recovers the ability to walk normally, however, our research proposes a promising new way for the spinal cord to make the connections needed to walk better."

The research involved people with incomplete spine injuries, no joint shortening, some controlled ankle, knee, and hip movements, and the ability to walk at least one step without human assistance. Research team members were based at Emory University, Georgia Institute of Technology, Shepherd Center in Atlanta, the Rehabilitation Institute of Chicago and the University of Wisconsin, Madison.

The participants were exposed to short periods of breathing low oxygen levels, which is called hypoxia. They breathed through a mask for about 40 minutes a day for five days, receiving 90-second periods of low oxygen levels followed by 60 seconds of normal oxygen levels. The participants' walking speed and endurance was tested before the study started, on the first and fifth days of treatment, and again one and two weeks after the treatment ended.

All participants improved their ability to walk. More than 30 percent of all participants increased their walking speed by at least a tenth of a meter per second and more than 70 percent increased their endurance by at least 50 meters.

"One question this research brings to light is how a treatment that requires people to take in low levels of oxygen can help movement, let alone in those with compromised lung function and motor abilities," says Michael G. Fehlings, MD, PhD, with the University of Toronto in Canada, who wrote a corresponding editorial on the study. "A possible answer is that spinal serotonin, a neurotransmitter, sets off a cascade of changes in proteins that helps restore connections in the spine."

Trumbower cautions that chronic or sustained hypoxia in untrained hands may cause serious injury and should not be attempted outside the scope of a supervised medical treatment.

The study was supported by the U.S. Department of Defense Spinal Cord Injury Research Program.

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